

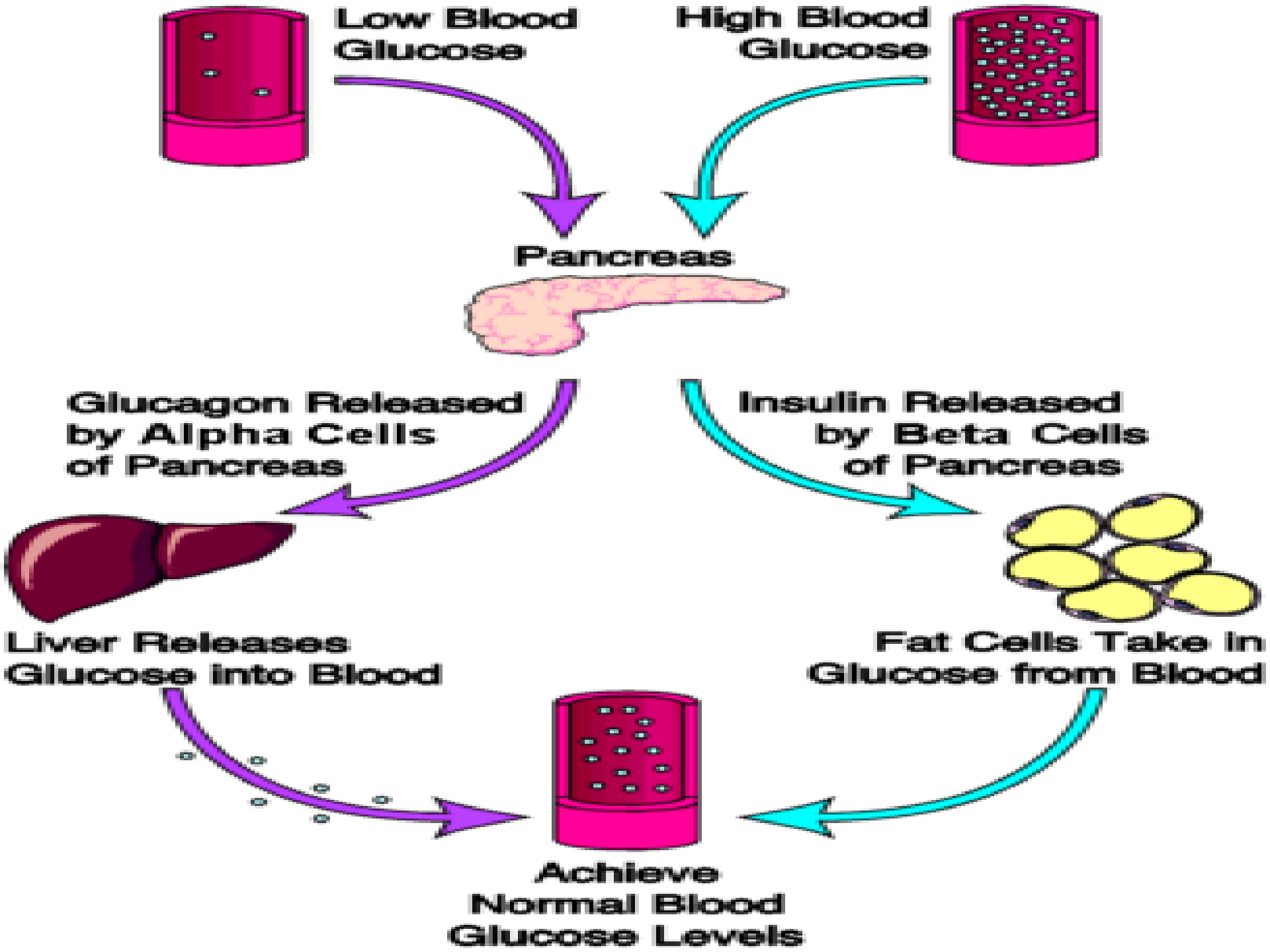


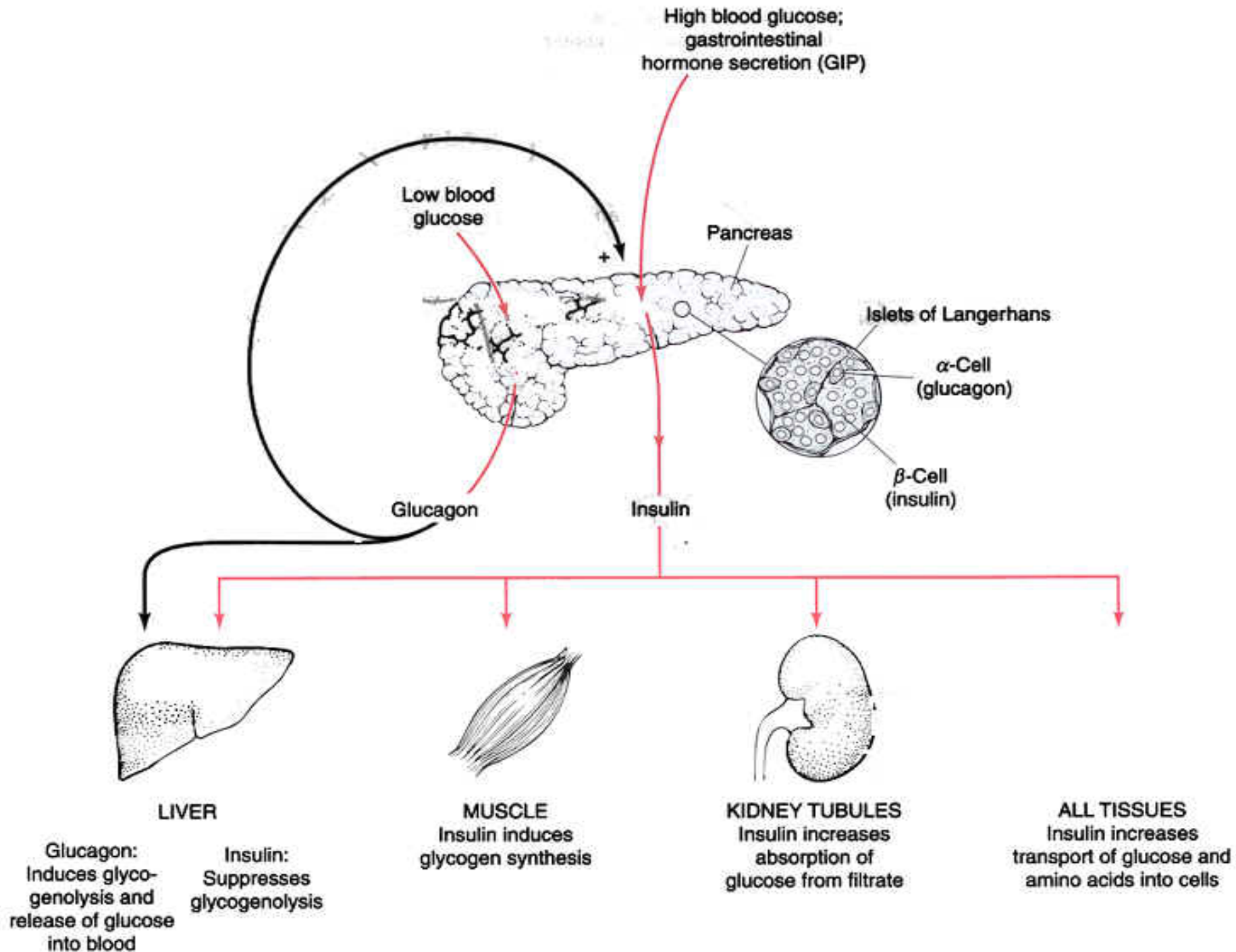
Get YOUR Game Plan against Diabetes

management through Nutrition and Exercise

Presented by Buvi Burugapalli

Outreach team
Community Center for Vital Aging

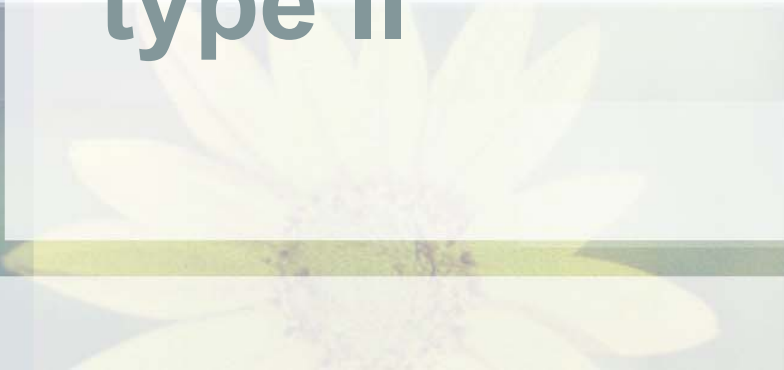




Diabetes



- **Over 16 million people in the US**
- **8 million Diagnosed, 8 million undiagnosed**
- **6% of total population 10% with Type I and 90% with type II**



Prevalence

- **Increases with age**
- **Gender Difference**
- **Racial, Ethnic –
Disproportionate
prevalence among African
Americans, Hispanic
Americans and American
Indian**



Increase in Overall Prevalence

- **Increasing Age of US population**
- **Reduction in Mortality Rate**
- **Increase in Risk Factors such as**
 - **Obesity**
 - **Physical Inactivity**



Mortality Risk



- **Duration of Diabetes**
- **Lack of Blood Glucose Control**
- **Cardiovascular Risk Factors such as**
 - **Smoking**
 - **High blood pressure**
 - **Abnormal Lipid Levels**
 - **Physical Inactivity**
 - **Central Obesity**



What causes Diabetes?

- **Obesity**
- **Sedentary Lifestyle**
- **Aging**
- **Genes**



Classification

- **Diabetes Mellitus**
 - **DM (type- I & type- II)**
 - **Impaired Glucose Tolerance**
 - **Gestational DM**



Types of DM



- **Type I DM (Insulin Dependent)**
- **Type II DM (Non-Insulin Dependent)**
- **Secondary/other types of diabetes associated with certain conditions**
- **Malnutrition related DM**



Type I DM

- **Presence of ketosis**
- **Almost complete lack of insulin or severe lack of**
- **Autoimmune Cause**
- **Patients commonly lean**



Type II DM

- **Most Common**
- **Strong Genetic Basis**
- **Absence of Ketosis**
- **Inadequate Insulin Secretion**
- **Obesity a strong factor**



Secondary/Other Type



- Related to certain diseases, conditions or drugs
- Known or probable cause
- Treatment of underlying disorder may ameliorate the diabetes
- Hyperglycemia present at level diagnostic of diabetes



Malnutrition Related Diabetes Mellitus



- **Mostly in developing countries**
- **Among 10 to 40 year olds**
- **Hyperglycemia present without ketoacidosis**
- **Role of malnutrition as a causal factor is unknown.**



Impaired Glucose Tolerance



- Higher than normal plasma glucose but lower than the diagnostic values for DM
- Precursor for Type II
- Only about 25% develop into type II and rest go back to normal
- Patients are more susceptible to macrovascular diseases.



Gestational DM



- **2-4% during second or third trimester**
- **Onset of DM with pregnancy**
- **More common in older women with family history of dm**
- **Higher chance of developing NIDDM and IGT**



Diagnosis of Diabetes

- **Increased thirst**
- **Increased frequency of urination**
- **Increased Fatigue**
- **Blurred Vision**
- **Increased occurrence of infections**
- **Abnormal Healing**



Risk Factors for Non-Diabetic Patients

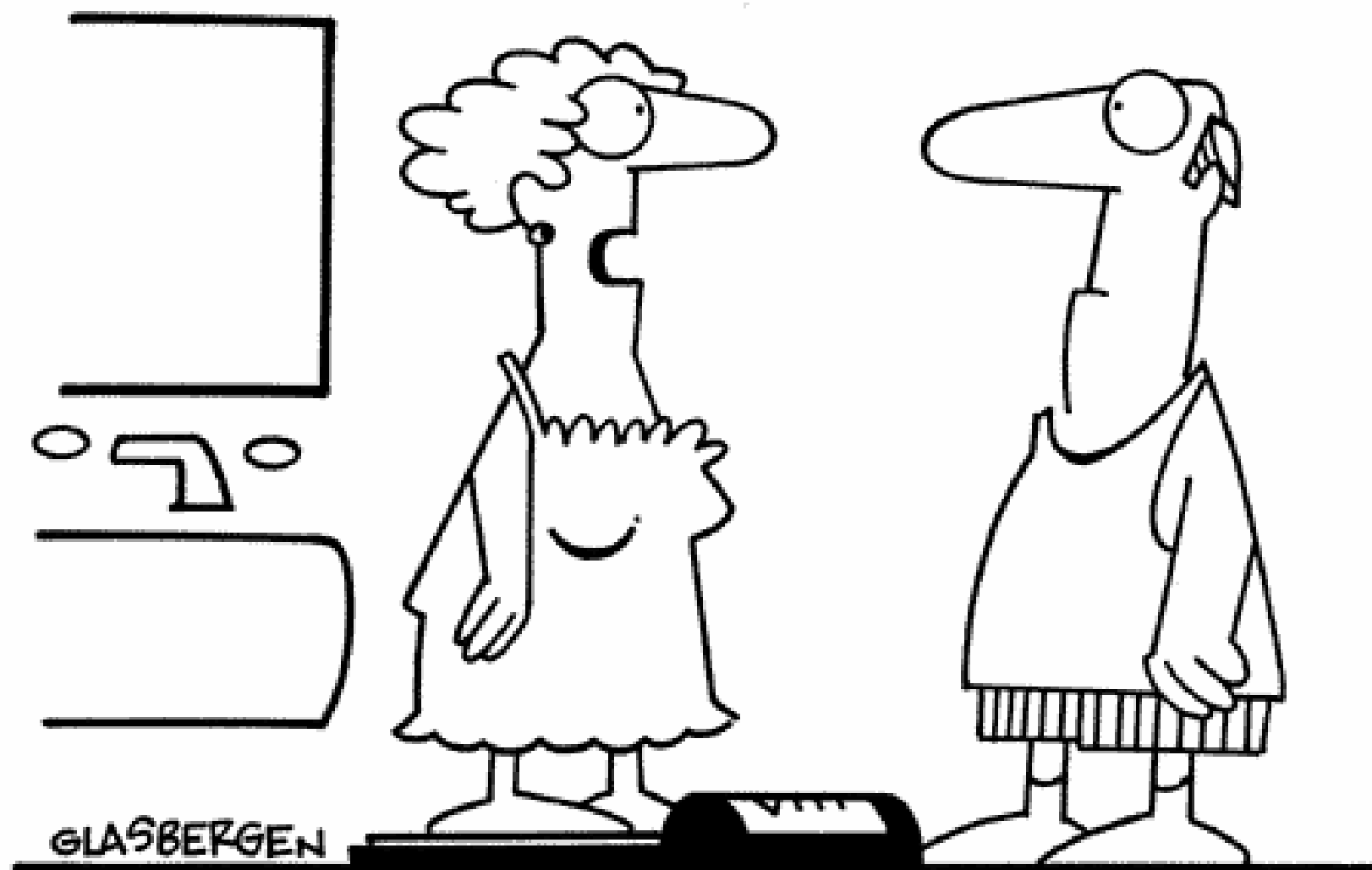
- Strong Family History
- Obesity
- Certain Races
- Women with previous GDM
- High Blood pressure
- hypertriglyceridemia
- 40 years old with any of the above



Nutrition

- Nutrition Therapy – The Most Fundamental Component of the Diabetes Treatment Plan
- Goals:
 - Near Normal Glucose Levels
 - Normal Blood Pressure
 - Normal Serum Lipid Levels
 - Reasonable Body Weight
 - Promotion of Overall Health

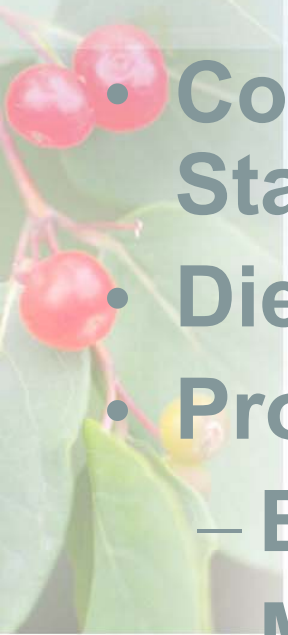




**“Why does it take six weeks to lose five pounds,
but only one day to gain it all back?”**



Nutrition Consult



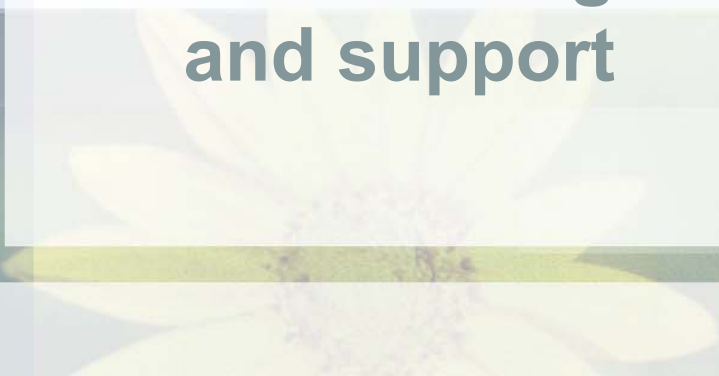
- **Conduct Initial Assessment of Nutritional Status**
- **Diet History, Lifestyle, Eating Habit**
- **Provide Patient Education Regarding**
 - **Basic principles of diet therapy**
 - **Meal planning**
 - **Problem solving**
 - **Developing individualized meal plan**
 - **Emphasize one or two priorities**
 - **Minimize changes from the patient's usual diet**



Nutrition Therapy



- **Provide Follow-up assessment of the meal plan to**
 - Determine effectiveness in terms of glucose and lipid control and weight loss
 - Make necessary changes based on weight loss, activity level, or changes in medication
 - Provide ongoing patient education and support



Advantages of Losing Weight

- Improves Glucose Control
- Increases Sensitivity to insulin
- Lower lipid levels and blood pressure
- Corresponding lowering of the dosage of pharmacologic agents



For a Successful Outcome

- **Modest** Caloric Restrictions
- Spreading caloric intake throughout the day
- **Increased Physical Activity**
- **Behavior Modification**
- **Psychosocial Support**



Caloric Intake



- **Women: 100 # for the first 5 ft of height plus 5 # for each additional inch over 5 ft.**
- **Men: 106# for the first 5 ft. of height plus 6# for each additional inch over 5 ft.**
- **Add 10% for larger body build, Subtract 10% for smaller body builds**
- **Multiply resulting weight by:**
 - **Men and Physically Active Women: 15**
 - **Most Women, Sedentary Men, and Adults over 55: 13**
 - **Sedentary Women, Obese Adults over age 55: 10**

Nutrient Components

- **Protein***
- **Fat***
- **CHO***
- **Sucrose and Fructose**
- **Nutritive Sweeteners**
- **Fat Replacements***
- **Vitamins and Minerals**
- **Alcohol Intake***



Protein Intake

- Small to medium portion of protein once daily
- **12-20% of daily calories**
- From both animal and vegetable sources
- Vegetable source less nephrotoxic than animal protein
- 3-5oz of meat, fish or poultry daily
- Patient with nephropathy should limit to less than 12% daily



Fat Intake

- <35% of total calories
- Saturated fat <10% of total calories
- Polyunsaturated fats 10% of total calories
- Cholesterol consumption < 300 mg
- Moderate increase in monounsaturated fats such as canola oil and olive oil (up to 20% of total calories)



CHO Intake



- CHO intake determined after protein and fat intake have been calculated.
- Emphasize on whole grains, starches, fruits, and vegetables
- Fiber same as for nondiabetics (20g to 35g)
- Rate of digestion related to the presence of fat, degree of ripeness, cooking method, and preparation

Nutritive Sweeteners and Fat Replacements

- Nutritive Sweeteners: corn syrup, fruit juice concentrate, honey, molasses, dextrose, and rice syrup have same impact on calorie and glycemic response
- Fat substitutes are derived from CHO or protein sources. So, CHO and Protein content should be reviewed before using



Nutrition



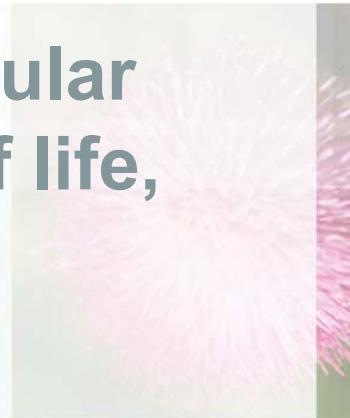
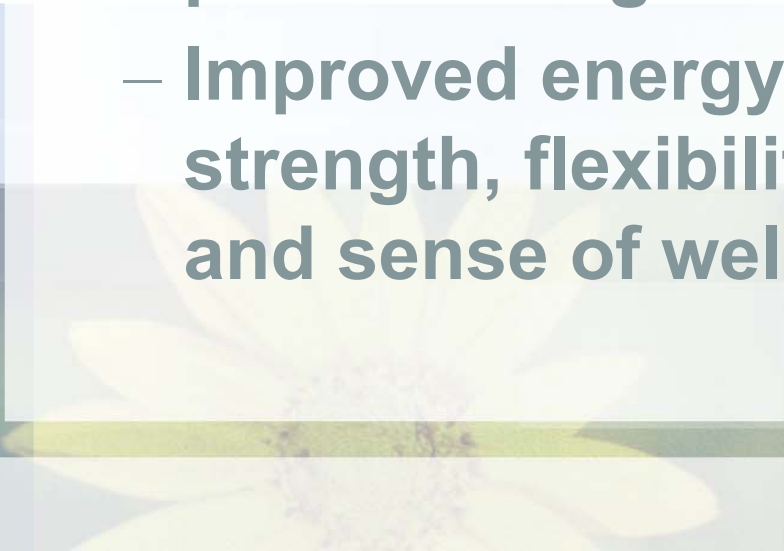
- **Individualized Diet Treatment Plan**
- Diet changes do not have to be dramatic
- Regular monitoring of blood glucose, glycated hemoglobin, lipid levels, blood pressure, and body weight

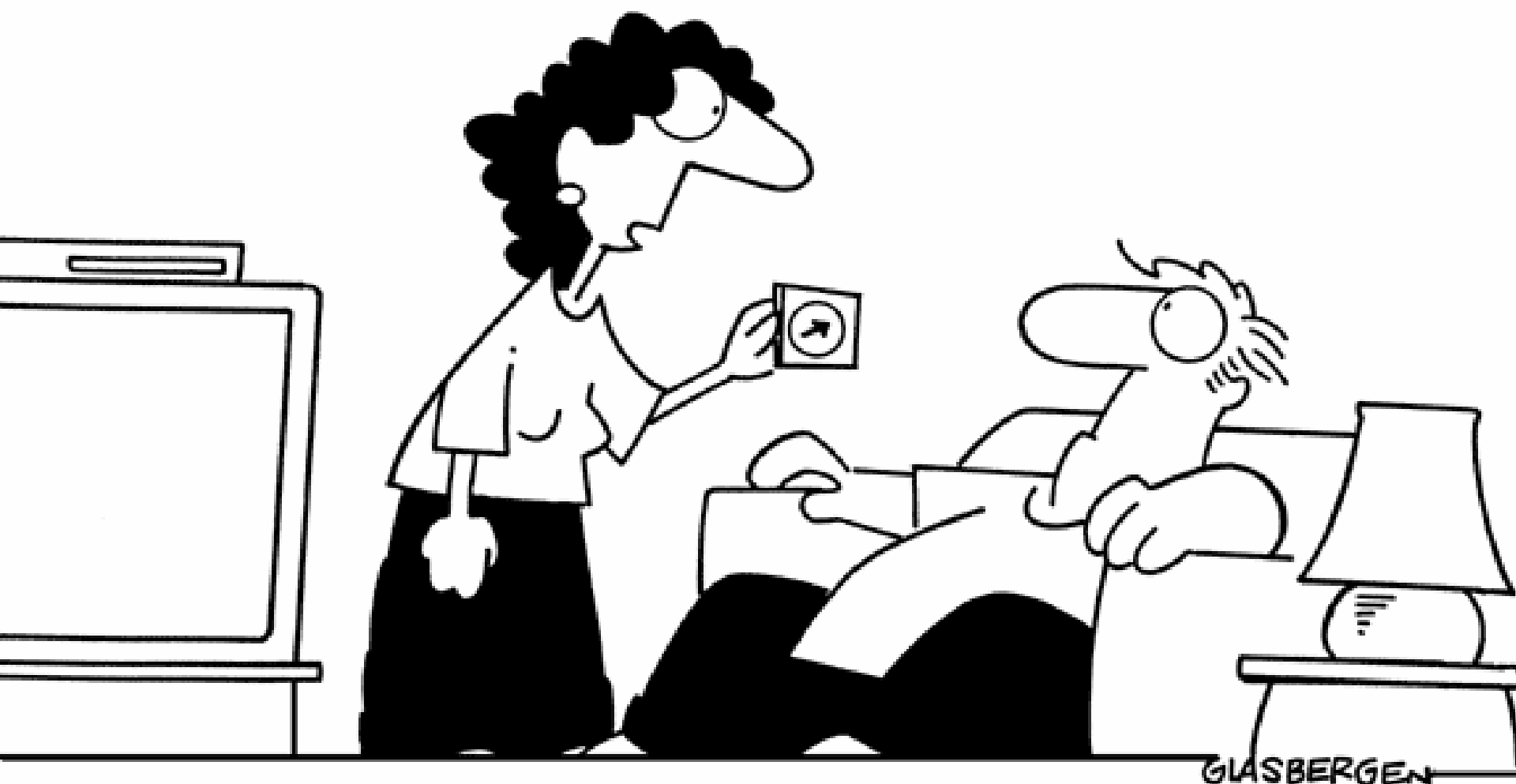


Exercise



- **Potential Benefits**
 - Improved Glucose tolerance
 - Weight loss or maintenance or desirable weight
 - Improved cardiovascular risk factors
 - Improved response to pharmacologic therapy
 - Improved energy level, muscular strength, flexibility, quality of life, and sense of well being





**“I bought this to help you with your diet.
It’s a compass that always points to exercise equipment.”**

Precautions and Considerations



- Consult a physician
- Rule out significant cardiovascular diseases or silent ischemia
- Prevent hypoglycemia with self-monitoring of capillary blood glucose (SMCBG) both before and after exercising
- Strenuous exercise not recommended for people with poor metabolic control and significant complications



Exercise Prescription

- Interest
- Capacity
- Motivation
- Physical status
- Individualized approach



Types of exercise



Walking

Biking and stationary cycling

Lap swimming and water aerobics

Weight lifting

At least 3-4 times a week, 30-40 minutes per session, 50 to 70% of maximum oxygen uptake



Acute Complications



- **Metabolic**
 - Diabetic Ketoacidosis (DKA)
 - Hyperosmolar Hyperglycemic Nonketotic Syndrome (HHNS)
 - Hypoglycemia
- **Infection**
- **Quality of Life**



Hypoglycemia



- **Factors Attributing to Hypoglycemia:**
 - Exercise
 - Alcohol Intake
 - Other Drugs
 - Decreased Liver or Kidney Function



Signs of Hypoglycemia



- **Glucose level < 60 mg/dL**
- **Mild Hypoglycemia:**
 - Pallor, Diaphoresis, Tachycardia, Palpitations, Hunger, Paresthesias, Shakiness
- **Moderate Hypoglycemia**
 - Inability to Concentrate, Confusion, Slurred Speech, Irrational or uncontrolled behavior, slowed reaction time, blurred vision, somnolence, extreme fatigue



Signs of Hypoglycemia



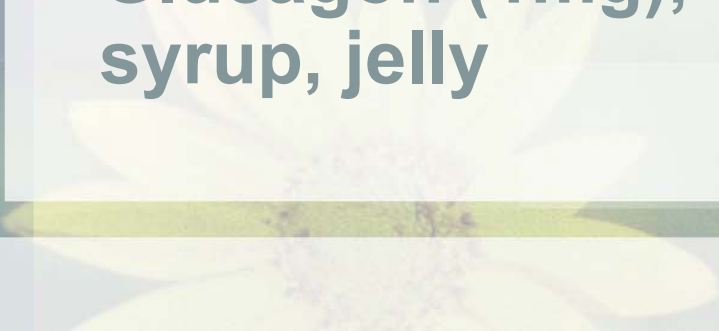
- **Severe Hypoglycemia**
 - **Completely automated/disoriented behavior**
 - **Loss of Consciousness**
 - **Inability to arouse from sleep**
 - **seizures**



Treatment



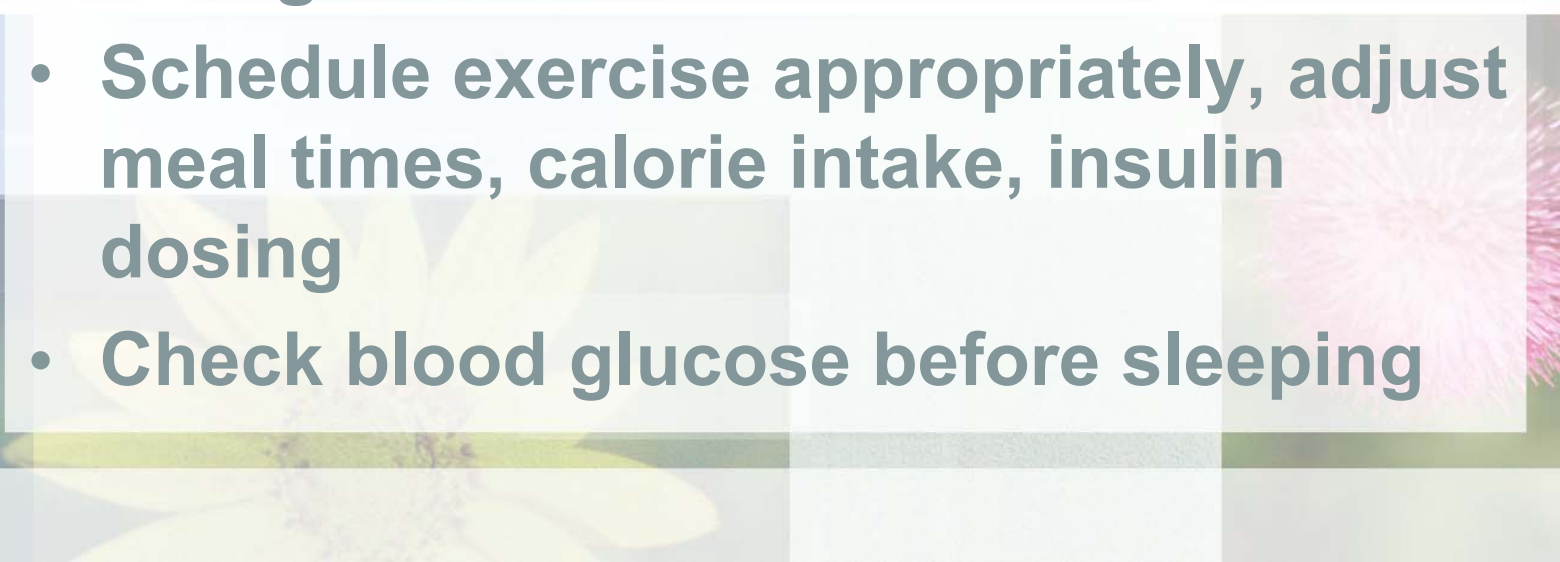
- Goal is to normalize the plasma glucose level as quickly as possible
- Mild Hypoglycemia: 3 glucose tablets, $\frac{1}{2}$ cup fruit juice, 2 tablespoon raisins, 5 lifesavers candy, $\frac{1}{2}$ to $\frac{3}{4}$ cup regular soda, 1 cup milk
- Moderate Hypoglycemia: Larger amount of CHO that are rapidly absorbed
- Severe Hypoglycemia: IV glucose or Glucagon (1mg), Glucose gel, Honey, syrup, jelly



Prevention



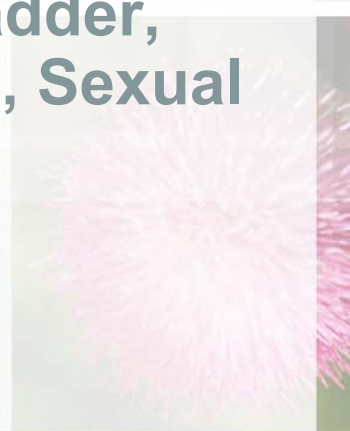
- Know the signs and symptoms of hypoglycemia
- Try to eat regular meals
- Carry a source of CHO
- Perform SMCBG regularly
- Use regular insulin 30 minutes before eating
- Schedule exercise appropriately, adjust meal times, calorie intake, insulin dosing
- Check blood glucose before sleeping



Long-term Complications of DM



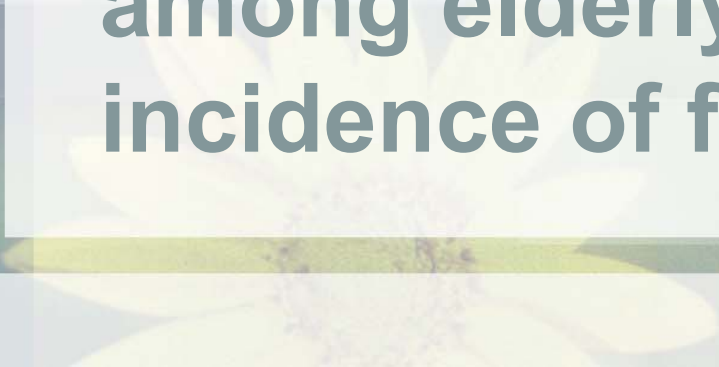
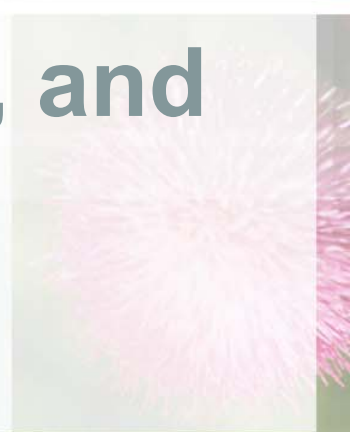
- **Macrovascular Diseases**
 - Hypertension
 - Dyslipidemia
 - Myocardial Infarction
 - Stroke
- **Microvascular Complications**
 - Diabetic Retinopathy, Diabetic Nephropathy, Diabetic Neuropathy, Diabetic Diarrhea, Neurogenic Bladder, Impaired Cardiovascular Reflexes, Sexual Dysfunction
- **Diabetic Foot Disorders**



Quality of life



- **Patients with blood glucose values consistently greater than 200 mg/dL will have a reduced quality of life.**
- **Poor work performance, infections, periodontal diseases, blurred vision, and among elderly, higher incidence of falls**





“What fits your busy schedule better, exercising one hour a day or being dead 24 hours a day?”